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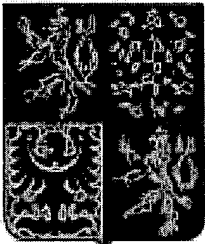
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Patent Document

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Reactor Containing Glass Reactionary Container with Mixer

(57) Abstract:

The fundamental analysis is this. In the bottom of the reaction container (1), an opening with a flange is formed (18), into which a hollow cylindrical body is mounted (2) affixed to the upper part of the flange (30), whose bottom surface rests against the sealing washer (20) in the bottom of the reaction container (1) on the external diameter of the hollow cylindrical body (2), a collar is mounted (3) with a fixed shoulder (31), whose upper part rests against a sealing washer (21), on the bottom area of the flange (18) of the opening of the reaction container (1); on the outside diameter of the hollow cylindrical body (2) a pliable strip is mounted (24), whose upper surface rests on the bottom area of the shoulder (31) collar (3) and fixed strip (23), which are tightened with nuts (22) also placed on the hollow cylindrical body (2) up to the stop of the upper area of the shoulder (31) collar (3) across the sealing washer (21) to the bottom area of the aforementioned flange (18) of the opening in the bottom of the reaction chamber (1), inside the upper part of the hollow cylindrical body (2) a shoulder is also formed (32), into which fits a flange (33) of the collar (4) mounted on the hollow cylindrical body (2) and tightened with nuts (5). In the aforementioned collar (4) a glass tube (7) is placed, in this glass tube (7) is the rotating shaft (6) of the mixer (26) in which magnets (16) and rotor poles (17), whereas the aforementioned cavity (26) is sealed off with a Teflon stopper (25), twisted into the glass tube (15) mounted in the bottom of the hollow cylindrical body (2) loaded at the bottom (12). The external rotor (10) of the magnetic coupler loaded with magnets (11), placed in its internal area outside of the hollow cylindrical body (2), and on the bottom part of the external rotor (10) the shaft (34) of the motor (8) is mounted, which with the help of the sheath (9) mounts into the collar (3) axially aligned with the hollow cylindrical body (2).

[cross-sectional picture shown here]

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The invention pertains to a reactor, which contains a glass reactionary container with mixer, whose shaft is set to rotate by magnetic coupling, and whose magnets, on the stator and rotor, are placed opposite each other, and vertically to axis of rotation.

With various reactors, the safeguarding of the mixture batch is required, for reasons of homogenization or securing of the conversion of energy. A solution to this problem is offered by transferring the rotational momentum of the motor to the mixer, with the help of magnetic coupling. This eliminates the problem of sealing off the rotating shaft. The shaft does not pass through the body of the container. Part of the coupling is placed on the shaft of the motor, outside of the container, and the second part is placed on the shaft of the mixer, inside the container. Here, it is necessary to analyze the various problems (associated) with the placement of the rotating part inside the container, or the problems with the design of the material used inside the container, which comes into contact with the batch.

By its design, this reactor eliminates many of the drawbacks. Its fundamentals are based on the fact that an opening, with a flange, is created in the bottom of the reaction container. A hollow cylindrical body is mounted here and is fastened to the upper part of the flange. Its lower area contacts the sealing washer in the bottom of the reaction container. A collar with a shoulder is mounted on the outer diameter of the hollow cylindrical shell, whose upper part contacts the sealing washer on the bottom area of the flanged opening of the reaction container. Mounted on the outside diameter of the hollow cylindrical body is also a pliable strip, whose upper surface contacts the bottom area of the collar shoulder, and a fixed strip, both of which are tightened with nuts. Placed likewise on the external diameter of the hollow cylindrical body, up to the stop of the upper area of the shouldered collar and across the pliable strip, towards the upper area of the flange opening in the bottom of the reaction container; inside the upper part of the hollow cylindrical body, a shoulder is formed, into which the flange of the collar fits, mounted to the hollow cylinder body and secured with nuts. In the aforementioned collar, a glass tube is placed, in this glass tube is the rotating shaft of the mixer, whose bottom has a cavity into which magnets and pole shoes are placed, whereas the aforementioned cavity is sealed with a Teflon stopper, twisted into the glass tube, in the bottom part of the hollow cylindrical body, loaded at the bottom.

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The external rotor of the magnetic coupler is loaded with magnets, placed in its internal area, outside of the hollow cylindrical body, and on the bottom part of the external rotor, the shaft of the motor is mounted, which with the help of a sheath fits into the collar axially aligned with the hollow cylinder body, whereas the hollow cylinder body, collar, nuts, shaft, bottom and stopper are manufactured from material that is chemically inert, with regards to the batch.

By design, this reactor has an advantage in that inside the glass reaction container, the magnetic coupling is built-in, so that the mixer is guarantees the perfect sealing of the inert material inside the container, during utilization of the large rotational momentum. In addition, the shaft is placed into the system of Teflon-glass, so that the rotational placement is cooled and lubricated by its own mixture.

An example of the inner workings of the reactor is shown in the drawing, where the features are shown in a partial sectional crosscut of the system.

In the bottom of the reaction container (1) an opening with a flange is formed (18), into which is a hollow cylindrical body (2) and affixed to the upper part of the flange (30), whose bottom surface rests against the sealing washer (20) in the bottom of the reaction container (1). On the outside diameter of the hollow cylindrical body (2) collar (3) fixed with a shoulder (31), whose upper part rests on the sealing washer (21) on the bottom area of the flange (18) of the opening in the reaction container (1), on the external diameter of the hollow cylindrical body (2) a pliable strip (24) is mounted, whose upper area rests on the bottom area of the shoulder (31) of the flange (3), and a fixed strip (23), both of which are tightened by nuts (22) also placed on the outside diameter of the hollow cylindrical body (2) up to the stop of the upper surface of the shoulder (31) collar (3) across the sealing washer (21), the bottom part of the aforementioned flange (18) of the opening in the bottom of the reaction container (1). Inside of the upper part of the hollow cylindrical body (2) a shoulder (32) is formed, into which the flange (33) of the collar (4) fits, mounted to the hollow cylindrical body (2) and tightened with nuts (5). In the aforementioned collar (4) a glass tube (7) is placed, in this glass tube (7) a rotating shaft (6) of the mixer is placed, whose bottom part (19) is a broad fixed cavity (26) in which magnets (16) and pole shoes (17) are placed. The

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cavity (26) is sealed off with a Teflon stopper (25) twisted into placed in the glass tube (15), mounted in the bottom part of the hollow cylindrical body (2) of the fixed bottom (12) fastened down with the help of screws (27) and a tight seal (28). In the bottom (12) a ceramic disc (13) is placed, and on which rests a glass ball (14) fitting into a depression in the stopper (25). The external rotor (10) of the magnetic coupler has magnets (11) affixed to its internal surface outside of the hollow cylindrical body (2) and the bottom part of the external rotor (10) is mounted on the shaft (34) of the motor (8), which is fastened down with screws (29) to the sheath (9) and with the help of this sheath (9) mounts into the collar (3) axially aligned with the hollow cylindrical body (2), whereas the hollow cylindrical body (2), collar (4), nuts (5), shaft (6), bottom (12) and the stopper (25) are manufactured from chemically inert material compared with the batch.

The reactor, by design, functions as such; the hollow cylindrical body, after mounting, forms a part of the reactionary material (1) and together with the bottom (12) separates, with the help of seal (20, seal (21) and seal (28) creates the internal area of the reactionary material from the surrounding air. Inside of the reaction container (1) is the batch, which is mixed by the unseen mixer placed on the shaft (6). The batch fills the entire area inside of the hollow cylindrical body (2), where the liquid cools and lubricates the rotating shaft (6), which has the affixed magnets (16) and pole shoes (17). It is placed in the glass tubes (7) and (15). Because the hollow cylindrical body (2) collar (4), nuts (5), shaft (6), bottom (12) and the stopper (25) are manufacture from suitable inert material, for example Teflon, the reaction container (1), glass tubes (7) and (15) and the ball (14) are manufactured from glass and the ceramic disk (13) is manufactured from ceramic material, the reactor design guarantees that the batch will not come into contact with metal or other non-suitable materials, and therefore is totally separated from the atmosphere during mixing.

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The external rotor (10) through magnetic coupling is rotated with the shaft (34) of the motor (8), on which is placed and turns with it, magnets (11), which are attached to the inner area of the external rotor (10) of the magnetic coupler (10), whereas the external rotor (10) is manufactured from material that functions like the pole shoe of magnets (11). Soft iron is an example.

The effect of the magnetic flux between the magnets (11) and the magnets (16), placed in the hollow cavity (26) of the bottom part of the shaft (19), turns the shaft (6) in conjunction with the motor (8).

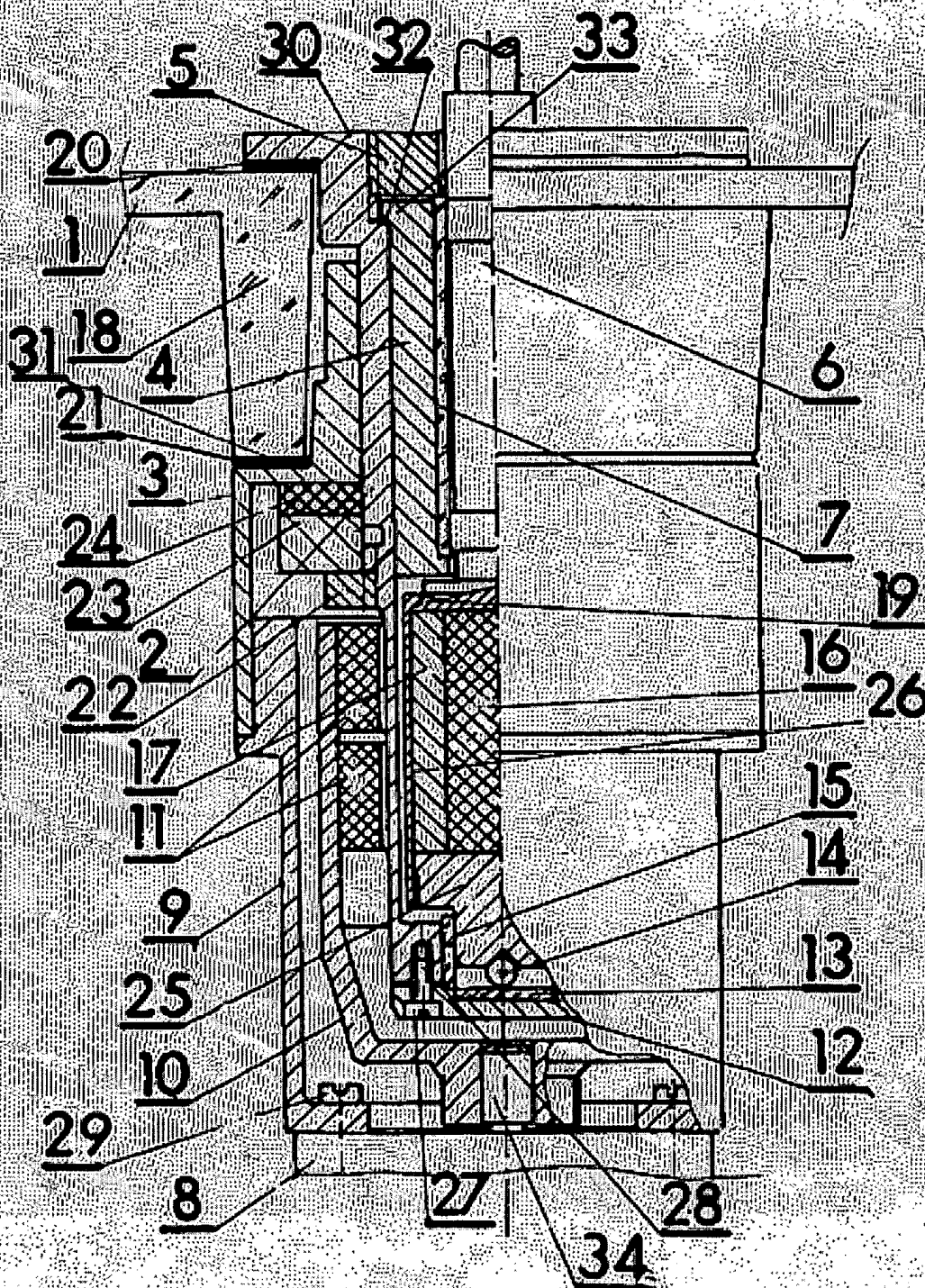
By design, the reactor, there are possible advantages, for use mainly in the chemical industry, for example in a photochemical reaction of tetrafluoroethlyene with methanol, in an inert atmosphere, for the formation of fluorine alcohol.

Patent Claims

A reactor containing a glass reaction container with mixer, whose shaft is mounted for movement through magnetic coupling, whose magnets are placed opposite each other, and vertically to axis of rotation, is distinguished by this; in the bottom of the reaction container (1) an opening with a flange is formed (18), into which is a hollow cylindrical body (2) and affixed to the upper part of the flange (30), whose bottom surface rests against the sealing washer (20) in the bottom of the reaction container (1). On the outside diameter of the hollow cylindrical body (2) collar (3) fixed with a shoulder (31), whose upper part rests on the sealing washer (21) on the bottom area of the flange (18) of the opening in the reaction container (1), on the external diameter of the hollow cylindrical body (2) a pliable strip (24) is mounted, whose upper area rests on the bottom area of the shoulder (31) of the flange (3), and a fixed strip (23), both of which are tightened by nuts (22) also placed on the outside diameter of the hollow cylindrical body (2) up to the stop of the upper surface of the shoulder (31) collar (3) across the sealing washer (21), the bottom part of the aforementioned flange (18) of the opening in the bottom of the reaction container (1). Inside of the upper part of the hollow cylindrical body (2) a shoulder (32) is formed, into which the flange (33) of the collar (4) fits, mounted to the hollow cylindrical body (2) and tightened with nuts (5). In the aforementioned collar (4) a glass tube (7) is

placed, in this glass tube (7) a rotating shaft (6) of the mixer is placed, whose bottom part (19) is a broad fixed cavity (26) in which magnets (16) and pole shoes (17) are placed. The cavity (26) is sealed off with a Teflon stopper (25) swirling placed in the glass tub (15), mounted in the bottom part of the hollow cylindrical body (2) of the fixed bottom (12) fastened down with the help of screws (27) and a tight seal (28). In the bottom (12) a ceramic disc (13) is placed, and on which rests a glass ball (14) fitting into a depression in the stopper (25). The external rotor (10) of the magnetic coupling has magnets (11) affixed to its internal surface outside of the hollow cylindrical body (2) and the bottom part of the external rotor (10) is mounted on the shaft (34) of the motor (8), which is fastened down with screws (29) to the sheath (9) and with the help of this sheath (9) mounts into the collar (3) axially aligned with the hollow cylindrical body (2), whereas the hollow cylindrical body (2), collar (4), nuts (5), shaft (6), bottom (12) and the stopper (25) are manufactured from chemically inert material compared with the batch.

1. Drawing



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